REMARKS

Claims 1-20 remain pending.

In the Office Action, the Examiner rejected claims 1-4, 6, 8, 9, 12, 13, 15-17, and 20 under 35 U.S.C. § 103(a) as being unpatentable over Nakatoh et al. (U.S. Patent No. 5,611,019) in view of Jankowski (U.S. Patent No. 4,052,568); rejected claims 5 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Nakatoh et al. in view of Jankowski and further in view of Kolesnik et al. (U.S. Patent No. 6,263,312); rejected claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Nakatoh et al. in view of Jankowski and further in view of Takada (U.S. Patent No. 5,907,624); and rejected claims 10, 11, 18, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Nakatoh et al. in view of Jankowski and further in view of LaMarche et al. (U.S. Patent No. 4,028,496).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See M.P.E.P. § 2143.

Applicants respectfully traverse the § 103(a) rejection of independent claims 1, 12, and 20 over Nakatoh et al. in view of Jankowski Claims 1, 12, and 20, as amended, require a method, system, and device including, *inter alia,* "transform[ing] each frame to provide transform products in each frame; analyz[ing] each frame to determine a number of transform products in each frame having an amplitude above a threshold; and for each frame compar[ing] the number of transform products to a validation range." Even if it were proper to combine the teachings of Nakatoh et al. and Jankowski, a *prima facie* case of obviousness has not been established, because the combination fails to teach or suggest at least the above quoted elements of independent claims 1, 12, and 20.

Page 3 of the Office Action reads the claimed "transforming . . ." on the "parameters obtained by FFT" in col. 11, lines 33 and 34, of Nakatoh et al.; reads the claimed "analyzing . .

." on the comparison of power value P_i from power calculator 11a to a power threshold value P_{TH} in col. 15, lines 3-6, of <u>Nakatoh et al.</u>; and reads the claimed "comparing . . ." on comparing a count number N (see Fig. 4) to a threshold N_{TH} in col. 15, lines 13-21, and Fig. 4 of <u>Nakatoh et al.</u>

First, this reading of the claims on <u>Nakatoh et al.</u> is internally inconsistent. Even if the parameters obtained by FFT corresponded to the claimed transform parameters, these have no relation to the power values P_i cited with regard to the second and third elements quoted above. After giving a list of possible parameters (see col. 11, lines 30 and 31 "the above-mentioned parameters may be selected from . . ." <u>Nakatoh et al.</u> goes on to disclose in lines 36 and 37 that "Example 1 employs the auto-correlation coefficients and the cepstrum coefficients." Not only is power not listed in the list of parameters, but also Fig. 1 (which shows Example 1 as taught in col. 11, lines 58 and 59) shows that only calculators 11b (auto-correlation) and 11c (cepstrum) are used in similarity computer 13 for comparison with a reference model. This is notable, because it shows that 1) of the group of parameters, FFT is not used in Fig. 1 (Example 1) (nor in Figs. 7, 11, and 14 (Examples 2-4)), and 2) power is not included of the group of parameters that includes FFT, because the output of calculator 11a is not used by similarity computer 13 as the outputs of calculators 11b and 11c are. Hence, the portions of <u>Nakatoh et al.</u> cited in relation to the second and third above-quoted claim elements do not relate to parameters obtained by FFT, and hence do not reasonably teach or suggest the claimed "transform products" as it has been read on <u>Nakatoh et al.</u>

Nor does the calculation of a single power value P_i for a frame reasonably teach or suggest "transform[ing] each frame to provide transform products in each frame" as claimed. Col. 12, lines 32-40, of <u>Nakatoh et al.</u> discloses that P_i is merely a sum of squared amplitude values across the frame. This does not reasonably teach or suggest "transform[ing] each frame," as required by claims 1, 12, and 20. Also, the single power value P_i for each frame (see col. 12, line 39: " P_i denotes a power value of a frame"; and col. 12, lines 46 and 47: "The computed power value P_i is applied to the final decision unit 15") does not reasonably teach or suggest the plural "transform products in each frame," as also required by claims 1, 12, and 20.

Second, col. 15, lines 3-10, of <u>Nakatoh et al.</u> only discloses comparing, for each frame, the frame's power value P_i with a power threshold P_{TH}. A period over which this comparison is positive is measured. Thus, <u>Nakatoh et al.</u> does not teach or suggest "analyz[ing] each frame to determine a number of transform products in each frame having an amplitude above a threshold," because <u>Nakatoh et al.</u> does not disclose determining "a number of transform products in each frame." Rather, all that <u>Nakatoh et al.</u> teaches or suggests is a binary comparison of a single, per-frame power value with a threshold, and not "determin[ing] a number" of products "in each frame." Thus, the binary decision in <u>Nakatoh et al.</u> does not teach or suggest "analyz[ing] each frame to determine a number of transform products in each frame having an amplitude above a threshold" set forth in claims 1, 12, and 20.

Third, regarding the final, "comparing" element of claims 1, 12, and 20, it has been explained above that <u>Nakatoh et al.</u> fails to teach or suggest both "transform products in each frame" and "the number of transform products in each frame." Page 3 of the Office Action also appears to admit that <u>Nakatoh et al.</u> also fails to teach or suggest "for each frame comparing ... to determine if the frame contains the signal component." All that <u>Nakatoh et al.</u> seems to actually disclose is comparing something (i.e., a number of frames N for which P_i exceeds P_{TH} (Fig. 4, steps 320 and 330)) with a threshold (i.e., N_{TH}, Fig. 4, step 350). Hence, Applicants respectfully disagree with the sweeping assertion on page 3, line 15, that "Nakatoh discloses a method similar to the present invention." With regard to at least the final, "comparing" element of claims 1, 12, and 20, this would only be true if one removed most of the words therein.

The teachings of <u>Jankowski</u> fail to cure any of these deficiencies in the primary reference, <u>Nakatoh et al.</u> First, <u>Jankowski</u> fails to teach or suggest the claimed "transform products," because it concerns only the amplitude of an input signal (see Fig. 1, "Amplitude" label of y-axis). No transforming of the input signal is taught or suggested by <u>Jankowski</u> (see generally, Fig. 2, inputs to detectors 7 and 15).

Further, even if <u>Jankowski</u> discloses using "individual speech samples" as alleged in the Office Action, it fails to teach or suggest doing anything "in each frame" as required by the above-quoted three elements of claims 1, 12, and 20. For example, the word "frame" does not

appear in <u>Jankowski</u>. Also, <u>Jankowski</u> only discloses at col. 3, line 65, to col. 4, line 1, detection of speech based on three or four consecutive samples. <u>Jankowski</u> gives no description or requirement that the samples need fall within a frame or other specified period, and does not teach or suggest "analyzing each frame" and "in each frame comparing" as required by claims 1, 12, and 20. In other words, <u>Jankowski</u> does not supply the "in each frame" teaching/suggestion that the Office Action admits is lacking in <u>Nakatoh et al.</u>

Because the combination of <u>Nakatoh et al.</u> and <u>Jankowski</u> fails to teach or suggest all claimed elements, a *prima facie* case of obviousness has not been established for claims 1, 12, and 20. The § 103(a) rejection of claims 1, 12, and 20 is improper and should be withdrawn for at least these reasons.

Dependent claims 2-4, 6, 8, 9, 13, and 15-17 are allowable at least by virtue of their respective dependence from claims 1 and 12.

Regarding dependent claims 5, 7, 10, 11, 14, 18, and 19, the addition of <u>Kolesnik et al.</u> (claims 5 and 14), <u>Takada</u> (claim 7) and <u>LaMarche et al.</u> (claims 10, 11, 18, and 19), even if proper, fails to cure the deficiencies of <u>Nakatoh et al.</u> and <u>Jankowski</u> explained above. <u>Kolesnik et al.</u>, <u>Takada</u>, and <u>LaMarche et al.</u> also fail to teach or suggest the above-quoted elements of the method, system, and device recited in independent claims 1, 12, and 20. The Office Action does not allege that <u>Kolesnik et al.</u>, <u>Takada</u>, and <u>LaMarche et al.</u> teach or suggest the claim elements at issue. Hence, a prima facie case of obviousness has not been established for dependent claims 5, 7, 10, 11, 14, 18, and 19, because the various references added to the deficient combination of <u>Nakatoh et al.</u> and <u>Jankowski</u> fail to teach or suggest all elements of these dependent claims.

A *prima facie* case of obviousness also has not been established for claims 1-20, because there is no suggestion or motivation to combine the teachings of <u>Nakatoh et al.</u> and <u>Jankowski</u>. The proposed justification on page 4 of the Office Action:

> ... to implement a more adaptive voice activity detection method by counting samples to detect the presence of noise for an audio segment (frame) to account for rapid changes in signal level from since the initial threshold comparison is performed over a shorter segment

contains neither citation to either reference nor technical reasoning why one of ordinary skill in the art would have been motivated to add the simple amplitude-based scheme of Jankowski to the more sophisticated scheme of Nakatoh et al. The Office Action's emphasis on "rapid changes" and "shorter segment" is misplaced, because Nakatoh et al. teaches other parameters (e.g., auto-correlation coefficient calculator 21b and cepstrum coefficient calculator 21c) that presumably operate on a faster time scale than power calculator 21a. In this sense, Nakatoh et al. teaches away from the combination, because it can already react rapidly to changes through its reference model. Because no suggestion or motivation to combine the teachings of Nakatoh et al. and Jankowski has been demonstrated in the references themselves or elsewhere, a *prima facie* case of obviousness has not been established for claims 1-20 for at least these additional reasons.
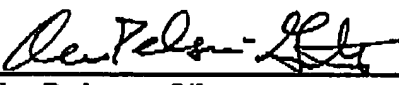
Reconsideration and allowance of pending claims 1-20 is respectfully requested.

In the event that any outstanding matters remain in this application, Applicants request that the Examiner contact Alan Pedersen-Giles, attorney for Applicants, at the number below to discuss such matters.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0221 and please credit any excess fees to such deposit account.

Respectfully submitted,

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